DOCUMENT RESUME

ED 121 861 TM 005 298

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TITLE	Generating Outcome Measurements: Economic and Societal. A Guide to Educational Outcomes Measurements and Their Uses. Seminar No. 4.
INSTITUTION	Centro Multinacional de Investigacion Educativa, San Jose (Costa Rica).; Georgetown Univ., Washington, D.C. Public Services Lab.
SPONS AGENCY	Agency for International Development (Dept. of State), Washington, D.C.
PUB DATE	Nov 75
NOTE	47p.; For related documents, see TM 005 295-297 and 299-300
EDRS PRICE	MF-$0.83 HC-$2.06 Plus Postage
DESCRIPTORS	Academic Achievement; Affective Tests; Data Collection; *Developing Nations; Economic Factors; *Educational Assessment; Educational Equality; Employment; *Guides; Income; *Measurement; *Measurement Techniques; Motivation; Political Socialization; Productivity; Seminars; Social Change; Social Factors
IDENTIFIERS	*Educational Outcomes; Modernization

ABSTRACT

This guide is essentially designed as a teaching aid for those who would inform planners, officials of educational ministires, school administrators, principals, and teachers about educational outcome measurements. In outline and graphic form, the guide presents topics for discussion in a seminar dealing with generating outcome measurements: economic and societal. An outline is presented and is intended as a preliminary "lesson plan." A discussion leader, selected by the group, will select materials appropriate for his or her group, adding and illustrating materials that are of particular interest to his or her country's (or region's) educational system. Steps required to use the seminar format are listed. At the end of the seminar those participating should: (1) Understand the kinds of choices to be made about selecting measures of economic and social effects of education in relation to the objectives of the project or program and the data implications of those choices; (2) Be familiar with the concepts underlying the several economic measurements and related motivational factors; and (3) Have some knowledge of the possible methods of collecting data required for the measurements or of using existing informational sources. (RC)

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ED121861

SEMINAR NO. 4

GENERATING OUTCOME MEASUREMENTS: ECONOMIC AND SOCIETAL

A Guide to Educational Outcome Measurements and Their Uses

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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A GUIDE TO

EDUCATIONAL OUTCOME MEASUREMENT AND THEIR USES

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Types of Outcome Measurements

SEMINAR NO. II
Uses of Outcome Measurement

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SEMINAR NO. IV

GENERATING OUTCOME MEASUREMENTS: ECONOMIC AND SOCIETAL

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November, 1975

This series was prepared as part of a project sponsored and funded under a contract with the Agency for International Development. The views expressed are those of the authors and not necessarily those of the Agency.

PREFACE

This guide essentially is designed as a teaching aid for those who would inform planners, officials of educational ministries, school administrators, principals and teachers about educational outcome measurements.

In recent years, educational services and facilities have made increasing claims on national economic systems. Since the needs of all public services, including education, are pressing and sum to totals far in excess of resources available, it has become urgent that governments initiate processes of questioning both existing resource uses and those proposed, asking: Can we serve the public better and more cheaply? What can we do that would more surely achieve the results we seek?

Responsible education, planning, and finance officials have indicated great interest in measurement of educational results as a beginning step to finding answers to these questions.

In outline and graphic form, this guide presents topics for discussion in seminars dealing with the following subjects:

I. Types of outcome measurements
II. Uses of outcome measurement
III. Generating outcome measurements (achievements and attitudes)
IV. Generating outcome measurements (economic and societal)
V. Applying outcome measurements
VI. Feedback consequences and steps toward implementation.

The outlines for six seminars which follow are intended as guides or preliminary "lesson plans." The discussion leader will select material appropriate for his group. His additions of information and illustra-

tive materials that are of particular importance to his country's (or region's) educational system would greatly enhance the discussion.

"Figures" are presented before each discussion question and are tended to serve as visual aids. The discussion leader may distribute copies to group members or he may find it helpful to enlarge the figures into charts to use for the discussion, or to have view graphs made for this purpose. To facilitate such use all figures are reproduced in appendix B.

The topics covered can be so selected that a general orientation about educational outcomes may be presented in summary form in a single seminar, or more in depth discussion would require at least 6 seminars. Extensive training of one year or more is required to develop skills needed to properly design measurement instruments or the analytical capacity to apply them. However, for those who have the required analytical and quantitative skills already, participation in the seminars outlined would help provide an understanding of the policy implications of the emphasis on outcomes. The seminars are not designed as technical training, rather they are intended to:

- Provide an understanding of the different types of educational outcomes.
- Identify the variety of uses of outcome measurements.
- Help convey the choices on outcome measurement instruments and yardsticks for policy officials, school administrators and teachers.
- Provide some rudimentary understanding of the tools of analyzing the correlates of education outcomes.
- Make plain the possible impact of emphasis on educational outcomes for educational planning and school finance, as well as work in the classroom.

To use the seminar format the following steps are required:

STEP 1
A seminar discussion leader must be selected.

STEP 2
The discussion leader, together with the educational officials sponsoring these sessions should identify the particular purposes of the seminar, and should answer such questions as: For whom are the seminars intended? What is the purpose of carrying out the seminar?

STEP 3
Seminars should be announced as an offering with (a) the clear indication of top level support, and (b) a practical use of the learning

achieved in the continued work of the official, administrator, or teacher.

STEP 4

The discussion leader might select from the materials and "figures" presented in this guide those that appear particularly useful for the specific groups with whom the discussions are scheduled.

As an aid in this selection process, Appendix A suggests some portions of the text that appear most important for the following groups:

- top officials concerned with overall policy planning
- middle management in Ministries of Education and Finance
- school administrators
- school principals
- teachers
- instructors in teacher training institutions.

STEP 5

Supplementary reading materials should be selected. Supplementary readings are available from the Public Services Laboratory of Georgetown University; these include **Educational Outcome Measurement in Developing Countries: An Annotated Bibliography;** and **Educational Outcome Measurement in Developing Countries.**

STEP 6

Some preliminary evaluation should be introduced at the close of the seminars to determine whether the objectives of each seminar have been fulfilled. This can be done by testing instruments, by questionnaire, or by final closing comments of participants.

Such evaluations tell us little about whether the seminars made a difference. Only practical application indicate whether the seminars were successful in changing traditional practices.

TOPIC TO BE COVERED:
HOW TO OBTAIN INFORMATION
AND SOCIAL RETURNS FROM EDUCATION

Objectives of Seminar No. IV

At the end of the seminar, those participating should:

(1) Understand the kinds of choices to be made about selecting measures of economic and social effects of education in relation to the objectives of the project or program and the data implications of those choices.

(2) Be familiar with the concepts underlying the several economic measurements and related motivational factors.

(3) Have some knowledge of the possible methods of collecting data required for the measurements or of using existing informational sources.

Introductory Question for Discussion

What are the special problems and data needed to reflect these problems; What are the economic, social, political and cultural "payoffs" from education?

NOTES FOR DISCUSSION LEADER

The discussion leader could open the conversation by asking for some identification of the kinds of economic, social and political returns from education that are important to development in each country. A listing of the types of outcomes being sought would then provide the basis for consideration of data—the statistics now available and those which have to be collected. Negative impacts of education, including attitudes toward work, should be explored along with possibilities of political instability originating in advanced schooling.

It should be recognized that many of the "payoffs" from education are very difficult to measure. It is impossible, for example, to record whether persons are mobile between tribes and whether there is intertribal trade. It is possible to record whether they have a common language for purpose of communication. It is far harder to quantify the relationship between education and the mobility and the trade. Even the commonality of language may be hard to attribute to specific educational undertaking.

The discussion leader might want to explore with the group problems of disentangling the various factors that contribute to an outcome. In the illustration given, nationalization is the general political objective. The several criteria identified "intertribal mobility," "intertribal trade," and "common language" are essentally proxies that are subject to a quantification.

Ideas on Presentation

Development is often said to require skills, knowledge, attitudes, and attributes of person consonant with change, with modernity, and with a questioning of the traditional that in the past has bound individuals to status and position appropriate for a culture of fatalism but often out of harmony with economic expansion and entrepreneurship and innovation for development.

In some cultures, the importance of education lies in building a common language, a common understanding, and a feeling of national unity that can forge a nation from the tribes or clans that go back to time immemorial. Part of this process is to remove the fear of movement from an area and the fear of change itself.

Other facets of development neglected on the earlier analyses of education included ones directly concerned with human growth and advance: such as nutrition, health care, and family planning, and

FIGURE IV-1

EDUCATIONAL OUTCOMES RELATING TO SOCIETAL OBJECTIVES OF DEVELOPMENT

Motivation to Change

- Initiative
- Creativity
- Leadership
- Risk-taking
- Self-reliance
- Tolerance

Economic Outcomes

- Regional balance and national economic growth
- Skill attainment and productivity increases (investment aspects)

  Direct measures—(actual change in production of goods, e.g., crop increases)

  Indirect measures—(changes in occupational status and earning)

Employment

- Changes in employability
  Access to Advance
- Income distribution consequences

Social Outcomes

- Social Mobility
- Social Integration
- Social Participation
- Health Level Improvement

Political Outcomes

- National Unity
- Democratization

those concerned with the individual in his economic capacity as innovator and entrepreneur.

Simplistic educational answers are no longer sought as solutions to developmental problems. But education lies at the core of much economic, social, and political development. This is said without denying the importance of the market demand for educated persons. Nonformal education can inculcate basic trade skills and agricultural techniques which have positive productivity consequences, only if there are crafts that permit more employment and farms that are using trained workers, or have land open for cultivation. Education leads to greater political awareness and participation in the political process. It leads also to change in social habits and a questioning of traditional patterns. Education can change attitudes which may foretell development—for example, types of education can lead to outward looking entrepreneural spirit.

Perhaps one of the major economic purposes is to achieve a greater measure of equality at least in the rural community by enlarging agricultural skills and crafts and, through education, encouraging enterprising persons to remain in the rural areas. (See Figure IV-1 for a partial listing of the variety of economic and social outcomes.)

Many proxies can be used to attempt to capture the concept of the objective sought and at least in part attempt a measurement. The identification of proxy measures is in some ways more an incentive art than it is a scientific undertaking.

EDUCATIONAL OUTCOMES RELATING TO SOCIETAL OBJECTIVES

Question for Discussion

Is the listing of educational outcomes relating to societal objectives of development sufficiently comprehensive or is the listing (a) too vague to provide a basis for selecting criteria output oriented objectives, (b) too lengthy to be meaningful for any one educational policy?

NOTES FOR DISCUSSION LEADER

In the beginning of the seminar there will have to be a discussion of the societal objectives connected with development. It would be useful to compare the list that was developed by the group with Figure IV-1. (While each group develops its own listing, past experience suggests that there is much agreement.)

There are measures that can be applied to test each of the outcomes. Some are more familiar and more comprehensive than others. Economic data, for example, is usually used. Psychological measures and tests are applied sometimes. The least explored are criteria for democratization.

In most instances, the range of educational outcomes shown in IV-1 would be too great to permit workable analysis of outcomes to be undertaken and some would not be relevant for the project or educational plan proposed. For each subsection of outcomes those using the outcome data would have to define the concept functionally so as to facilitate quantification. Where quantification is not feasible, a compilation of judgments about the quality or the change produced by educational services would provide information to those applying the outcome measurements.

Ideas on Presentation

Educational outcomes related to societal objectives include motivational objectives and economic, social, and political outcomes. While Figure IV-1 does not include cultural outcomes, some would argue that these are important too. In some respects, the cultural patterns of thought that are deemed vital to economic development are those enumerated under motivation for change and social outcomes.

Psychologists and sociologists have developed instruments to measure behavior and attitudes that relate to development and the patterns that create a climate favorable to growth. And by the same token, they have measured patterns that retard. Motivation to

change criteria identified by example in the listing shown have been applied by some investigators. Instruments to measure such motivation to change are available. If anything, too many instruments applied to populations too small to assure validity pose more of a problem than absence of measurements.

Some outcomes and the illustrative criteria enumerated may be applied to specific industrialization projects or to specific communities. Some are essentially nationwide measures such as national unity outcomes.

To repeat, criteria are useful in assessing results of educational projects and plans only if they match objectives. Past concepts of education and growth were too simplistic to match reality. Balanced growth appears to be essential and education is one component of the growth. Moreover, education has to be related to specific development objectives. Earlier dominant concern also was with formal schooling and the advance in learning, mainly in the cities. But uneven growth as between rural areas and cities tended to attract population to the cities and weakened production in the rural areas on two counts: the migration of the best of the workers to the cities and the lack of motivation that uneven wealth and income breeds. Development demanded more than returns to education for those with university education. It required that opportunities be offered to those in both rural and urban areas and that there be some opening to the disadvantaged of possibilities for improvement through rural development. Such a concept points to functional education, functionally defined by skills and to the competence necessary to carry out that development. It lends itself to measurement perhaps more readily because of its functional orientation.

GATHERING DATA ON ECONOMIC, SOCIAL, AND POLITICAL OUTCOMES

Question for Discussion

What are the more effective approaches to gathering the data on economic, social, and political outcomes?

NOTES FOR DISCUSSION LEADER

Many of the measurements require fuller use of census data, carrying out of new surveys, use of trained observers. Census data collected in most countries include data on education such as literacy or illiteracy and years of formal schooling completed. Also, data are collected on a range of correlates that permit better analyses of education to be made.

It probably would be useful to present some examples in which (1) new data have been collected and analyzed such as the I.E.A., intercountry comparative survey of education, and the Hans Thias study of employment and earnings;* and (2) census data have been analyzed as in the World Bank study in Paraguay. Also, it would be useful to suggest that data that are administratively collected in the course of running a project would in some instances yield an appropriate kind of proxy measure of outcome such as the training program for electric line operation in Indonesia.

These examples could be the basis for encouraging discussion in the group on their experiences in trying to obtain information that can provide the basis for evaluation or policy analyses.

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* Discussed in the supplementary reading materials.

Ideas on Presentation

The data sources for outcome measurement are varied. A suggestive listing contains the following:

Existing data (direct or proxy)

- Census data
- Data routinely collected by government agencies
- Use of proxy data (data collected for a collateral purpose but employed in outcome measurement)

Special surveys—data generated by a concentrated effort for a particular problem—e.g., employment of school leavers

- Observation or monitoring in the field
- Experimental findings
- Use of natural experimental data from varied practices
- Experimental project designs with controls.

Data sources can be as institutionalized as school enrollment figures collected routinely by the Ministry of Education or they can be as informal as field reports from an agricultural extension agent. In some cases, proxy data may be employed—for example, income serves as a proxy for productivity. In a few instances, rigorous controlled experiments may be conducted and subjected to statistical analysis. Longitudinal studies following individuals over a period of years is still an additional method, although clearly a costly one. Figure IV-2 (on page 14) details some of the sources of data relating to each type of outcome. Additional detailed examples are presented in later discussion in this Seminar.

FIGURE IV-2

POSSIBLE APPROACHES TO MEASUREMENT OF SELECTED OUTCOME INDICATORS

	EDUCATIONAL OUTCOME	APPROACHES FOR MEASUREMENT
Motivation to Change	*(1) Initiative*	— observation (structured) — self-report (interview) — employer reports
	(2) Leadership	— self-report (questionnaire) — unobtrusive measures (election to office, promotion) — employer reports — non-cognitive tests — observation of community responses
	(3) Risk-taking self-reliance	— self-reports (noncognitive tests, interview, questionnaires) — observation of conduct in community
	(4) Tolerance	— selfreport (noncognitive tests) — observation — reports of associates
	(5) Attitudes on Work	— self report — observation — employer reports
Economic Outcome Indicators	*(1) Regional balance and economic growth*	— urban-rural survey data
	(2) Direct measure of productivity changes	— questionnaire — physical productivity measurement
	(3) Indirect measures of productivity changes	— survey or census; income-education data; cost data
	(4) Unemployment	— urban-rural survey data — observation of male activity
	(5) Income distribution	— census data — survey data observation of differences in property holdings (cattle, house, etc.)
Social Outcome Indicators	*(1) Social participation*	— unobtrusive measures such as (migration to cities; movement among tribes; membership; contributions) — self reports (questionnaire on civil and community participation)
	(2) Health level improvement	— self-report (questionnaire on health practices, attitudes, knowledge) — unobtrusive measures (infant mortality, incidence of cetain diseases) — observation of behavior on health practices
Political Outcome Indicators	*(1) National integration*	— self-reports (questionnaire on attitudes, political participation) — unobtrusive measures (migration, urbanization)
	(2) Democratization	— self-reports (questionnaire on attitudes towards justice, merit and reward, voting practice) — unobtrusive measures (voting pattern)

MEASURING ATTITUDES AND PERSONAL CHARACTERISTICS RELATED TO MODERNIZATION

Question for Discussion

If modernity is an objective of an educational policy for development, how might this quality be tested for its impact on development?

NOTES FOR DISCUSSION LEADER

The various studies that have been made of modernity could usefully be presented to the group for discussion. Among the persons who have contributed to this research are Inkeles, Manaster and Havighurd, Hong and McClelland. In very summary form, these are discussed in the readings supplementary to this seminar. The several researchers have developed their own concepts of modernity and instruments to measure it.

The group's ideas about modernity might be sought starting from the list drawn up by Professor McClelland. Some of the participants may have had experience with application of one or another of the several measures and may have study findings to present.

An example is presented in Figure IV-3 drawing on an experimental study by McClelland. It might be useful to review with the group the desirability or experimental study designs with appropriately selected "participant" and "control" groups.

Ideas on Presentation

Education contributes to the process loosely termed modernization by either changing attitudes through the formal or nonformal schooling process or by specially designed educational programs. There are testing instruments designed to capture facets of this process—instruments to measure attitudes toward modernization, self-initiative, sense of fatalism, and risk-taking. Their use, as outcome measures, involves connecting them with the educational process.

Some of the testing scales which have been developed and the characteristics they capture are listed below. The testing instruments themselves are commonly available. Their use as education outcome measures involves estimating how education changes attitudes and attributes.

- Modernism—Traditionalism scale (Activism—Fatalism, Stratification—Social mobility, Interdependence on relatives)
- Risk-taking scales

FIGURE IV-3

MEASURING RESULTS OF EDUCATION FOR MODERNIZATION

Results of n-Ach Training in India:

Percent of Participants who Increased Activity	*Before Course 1962-1964*	*After Course 1964-1966*
Participants in n-Ach training	18%	51%
All controls	22%	25%

Increased achievement motivation showed up in the following economic measures:

Hours worked — at the end of the two-year follow-up twice as many participants reported working longer hours than before the course.

New firms — between 1964 and 1966 almost one trained man in four started a new business (increase from 4 percent to 22 percent); controls remained at about the same level (7 percent to 8 percent).

Capital invested — about ⅓ of all businessmen made specific investments; after training that proportion rose to ¾.

Labor employed — participants employed greater numbers after training than controls.

SOURCE: Adapted from McClelland, David and Winter, David G. *Motivating Economic Achievement.* New York: The Free Press, 1969.

- Rigidity scales (Need for stable predictable environment, Conservation and conventionality, Opposition to change in plans, Learning new ways of doing things)
- Attitude toward work
- Self-concept
- Internal-external locus of control.

If modernization is important to development, education programs directed at inculcating outward looking attitudes are needed. McClelland's work is well known in this regard. He has drawn up a list of characteristics related to modernization and entrepreneurial activity as follows:*

(1) moderate risk-taking (a function of skill, not chance);
(2) decisiveness;
(3) energetic, innovating activity (works hard, works long hours, tries to do things in new and/or better way);
(4) individual responsibility;
(5) knowledge of results of decisions;
(6) organizational abilities; and
(7) long-range planning.

From here he postulated the presence of "n-Ach," need for achievement, which characterizes successful entrepreneurs. A program of instruction designed to produce this orientation was tried in India, and the results are exhibited in Figure IV-3. These results lead McClelland to conclude it is possible to devise a training program which will change attitudes relating to modernization.

* Adapted from McClelland, David. *The Achieving Society*. Princeton, New Jersey: D. Van Nostrand Company, Inc., 1961, p. 207.

MEASURING PRODUCTIVITY CHANGE: DIRECT MEASURES

Questions for Discussion

How might increased productivity be measured? In rural areas? In selected city employments? (Productivity, it should be noted, has both quality and quantity dimensions.)

NOTES FOR DISCUSSION LEADER

A number of different approaches can be taken to measure productivity change. All of these are difficult to carry out. One method would be to count the physical volume produced. Does this output go up for those who have had training and down for those who are not trained? Or, at a somewhat lower level, more process change may be quantified, namely, do those who have completed a course of study have the understanding and knowledge necessary to perform a job and to produce the final goods and services that will enhance productivity in the country? A number of work skill tests have been developed and more are being developed through the Educational Testing Service. These tests are usually work-sample tests that can show what has been learned after a period of training.

Clearly, there are limitations to such process measurements because individuals may know well "how to do" and yet, for a variety of reasons, not perform in achieving increases in physical product.

It may be useful to consider with the group various methods of approaching measurements of productivity increases in the context of developing countries and levels of industrialization. The leader could also encourage a discussion of quality of product changes and physical output changes.

An example that draws on an agricultural program is given in Figure IV-4. In some ways, farm crops and the amount produced are easier to count. But, as with other goods, differences in quality exist and these are an important variable in productivity assessment. In the absence of hard data, the views of participants in projects that are varied as to content or "inputs" may be used to gather some information for purposes of project assessment.

Ideas on Presentation

Measurement of changes in productivity of the individual is the most important economic measure of educational outcomes. Productivity is generally defined as physical output per unit of labor. Unit of labor for this purpose could be man-hours, man-days, man-years, or any other measure showing the labor input during a given period of time. Sometimes the input measure is constructed to reflect the capital an individual has to work with, including both physical

capital and education. It is this last aspect which most directly concerns us since we wish to gauge how output might vary as the knowledge and skill of the individual changes.

Measurement of the direct productivity effects of training or education is difficult. This is because assessment of the physical productivity of an individual controlled for quality is complex. Conceptually, the change in physical output must be related to the

FIGURE IV-4

THE OVERALL ASSESSMENT OF THE USE OF IMPROVED AGRICULTURAL PRACTICES— A SUBJECTIVE ASSESSMENT BY RESPONDENTS

Responder	PI *n* = 72		NPI *n* = 72		PNI *n* = 36		NPNI *n* = 36	
		%		%		%		%
Yield up 75-100%	48	66.67	40	55.56	11	30.55	7	19.44
Yield up 50-75%	13	18.06	12	16.67	13	8.33	2	5.56
Yield up 25-50%	—	—	7	9.72	2	5.56	3	8.33
Less than 25%	—	—	9	12.50	3	8.33	3	8.33
Not increased	3	4.17	—	—	7	19.44	8	22.22
Decreased	4	5.76	2	7.78	1	2.78	4	11.11
Not stated	4	5.76	2	2.78	9	25.00	9	25.00
Total	72	100	72	100	36	100	36	100

PI = participant in literacy program with input (material, reeds, etc.) from CADU (Chillalo Agricultural Development Unit)
NPI = non-participant with input
PNI = participant in literacy program with no input
NPNI = non-participant with no input

change in the input—in this case, the education the individual receives. The difficulty lies in conducting a controlled experiment—taking into account or eliminating other factors which may affect output.

Take the example of an informal education program in agriculture. An example might be the World Oriented Adult Literacy Programs (WOALP) of UNESCO. Individuals learn to read using materials that describe improved agricultural techniques for their region. They receive instruction in agriculture along with their literacy instruction. This type of education should be reflected in increased crops if weather and other circumstances permit. Measurement problems are many, however, including separating out the effects of quality of land, individual motivation, weather, and so forth. One way of partially separating out the effects of the educational progress is to survey selected groups of participants of educational programs and nonparticipants and to record relative changes in yield of their land over a given period. An example, from WOALP in Ethiopia, is given in Figure IV-4.

The four groups identified are those who participated in the educational program and also those who were part of a regional development effort (CADU) as well as those who were not. The subjective estimates of responders give some idea of direct productivity effects. While this is an imperfect way of measuring the direct productivity consequences, the more elaborate approach is costly. The largest improvement is reported when both training is provided and assistance is given on materials and equipment for farming.

MEASURING PRODUCTIVITY CHANGE: INDIRECT MEASURES

Question for Discussion

Are there differences in earnings between those with specified types of education and those without a reasonable measure of productivity change?

NOTES FOR DISCUSSION LEADER

It might be useful to indicate that there are a number of studies that undertake to determine productivity changes by differences in earnings between those receiving the specified education and those not receiving the education. But many factors affect earnings other than formal education such as family and social position. The effect of education has to be factored out.

In Figure IV-5 and subsequent figures, various facets of the measurement of an educational program's results in terms of earnings (or income) are presented to be used in discussion about private and social returns from education.

In Figure IV-5, steps in an analysis of education and income are presented. It might be useful to call attention to the Ethiopian example and a study by Thias and Carney (discussed at some length in the supplementary reading materials) primarily to suggest that it was possible to collect data at a reasonable cost through labor force survey on such items as : age, wages or salaries, sex, years of schooling completed, type of schooling, father's occupation, parents' literacy, ethnic origins, and age of finishing school and beginning work. The purpose of these data is to isolate the effect of education on earnings without the influence of other factors affecting income.

Ideas on Presentation

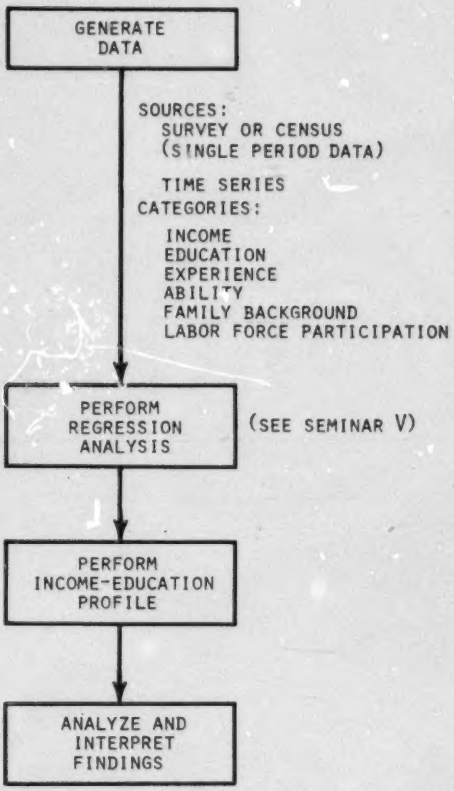
An indirect approach to productivity change involves relating income to education and using the change in income as a proxy for change in productivity. The notion is that income differences reflect productivity differences and hence a higher income means greater productivity.

Steps to be used in carrying out such measurements are contained in Figure IV-5.

An example is the construction of education-income profile for Ethiopia. The data was of the survey type and was collected by the Ministry of National Community Development and Social Affairs. The data included education, age, incomes, and a variable denoting whether the individual worked in the public or private sector. Using

FIGURE IV-5

STEPS IN INDIRECTLY MEASURING PRODUCTIVITY THROUGH INCOME



regression analysis, the equation estimated was:

$\text{Log } Y = a + bX_1 + cX_2 + dX_3$

Y is income

X_1 is age

X_2 is years of schooling

X_3 is a variable showing public or private sector employment

Log Y is used to measure income growth

The results of the estimation in Ethiopia are:

$\text{Log } Y = 2.36039 + .01135X_1 + .08025X_2 + .13765X_3$

This approach gives the following information—each year of school raises income by 20.29 percent. This estimate derived from the equation is a rough approximation of education's productivity increasing effect.

Why include the other factors? Because all relevant explanatory factors should be included if the role effect of education is to be gauged.

Income returns from education are dependent upon employment. It may be less costly to determine the changes in employment than changes in income. For one thing, the employment effects of education can be measured through detailed surveys of the experiences of school leavers. An increasingly widespread phenomena is the high rate of unemployment among educated groups, particularly secondary school leavers, in many countries. This outcome can be measured if detailed sector or countrywide data are collected by the appropriate ministries. Or special studies can be undertaken to follow the employment paths after school. Frederick Harbison has suggested the use of tracer or longitudinal studies—selected follow-up studies. This has been done in Kenya and the revealed unemployment rate is high, higher than the official estimate.

EARNINGS AND LEVEL OF SCHOOLING COMPLETED

Question for Discussion

What do earnings comparisons by level of schooling provide as a guide to educational planning?

NOTES FOR DISCUSSION LEADER

Figure IV-6 provides data on earnings relative to schooling completed. The information presented is characteristic of much earlier study of education as an investment.

Such data essentially raise the question: How much of the earnings difference is attributed to the differences in length of schooling and level of formal education achieved? Factors affecting the relationship between education and earnings might be identified during the discussion and a list made for group comment.

The earlier discussion, for example, of the Thias-Carney survey items might be linked to the varied factors identified as determinants of earnings.

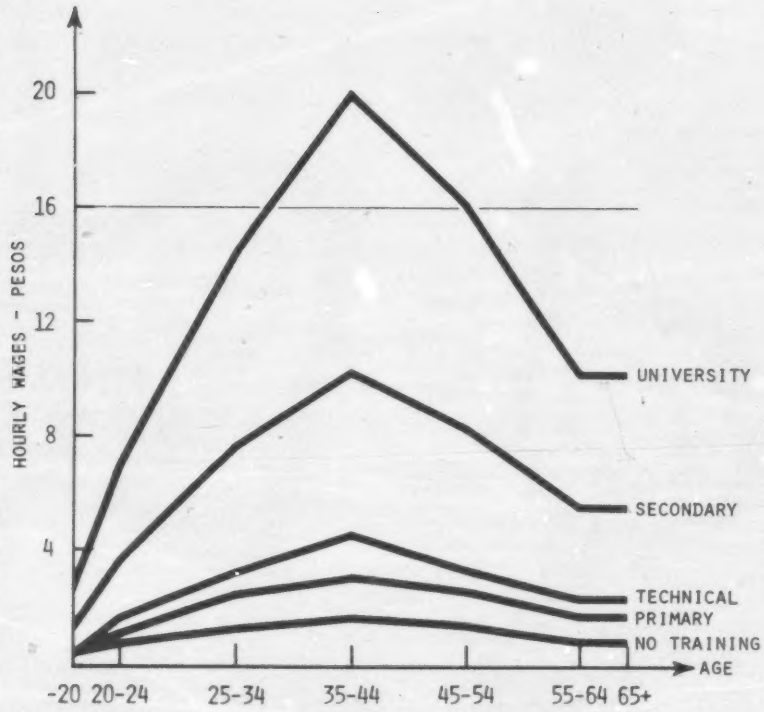
Ideas on Presentation

The relations of earnings levels and schooling is illustrated in Figure IV-6 that draws on a case study by UNESCO-International Institute for Educational Planning (IIEP) in Bogata, Colombia. It shows hourly wages for men by age and level of schooling. Earnings are substantially higher for those with university education than for those with lower levels of education. Many factors, such as differences in family wealth, ability, sex, parents' education, social status and so forth, affect the relationship displayed as does demand in the economy for secondary and tertiary levels of education.

When the amount of income attributable to education is determined, it is possible to further analyze educational expenditures in terms of benefits gained for costs incurred. However, many factors other than education contribute to the hourly wage differences. Furthermore, education includes informal as well as formal levels of schooling and it encompasses nonformal education as well.

FIGURE IV-6

EARNING AND LEVELS OF SCHOOL COMPLETED: AN EXAMPLE, BOGATA, COLOMBIA, 1965



SOURCE: UNESCO-IIEP, Educational Cost Analysis in Action: Case Studies for Planners II, Paris, 1972.

RATES OF RETURN ON EDUCATION

Question for Discussion

Are rates of return on education, approximate though they may be, a factual basis for educational decision?

NOTES FOR DISCUSSION LEADER

No discussion of educational outcomes would be complete without mention of the work of many scholars and agencies on investment returns to education and the way in which those returns were conceptualized.

Net present discounted value and internal rate of return are two measures of economic outcomes of education that were developed.

To compute the net present discounted value, it is necessary to have data on earnings differences attributable to education. These differences for the length of a working lifetime are cumulated to determine the present value, but in order to arrive at the present value, each year's future earnings must be discounted to its present year value. This is done so that account may be taken of the fact that individuals would prefer to have $95 now than $100 next year. The cost of education is subtracted to determine *net* present discounted value. In determining the amount to subtract, account has to be taken not only of the direct costs of education but of the amount of earnings foregone while the individual is being educated so that the length of the period of education has much bearing on its cost.

The internal rate of return is determined by finding the rate of interest at which the benefits of education (represented by the earnings differentials attributed to education over the span of years of earnings) are equal to its costs. These rates can then be compared with other investments.

A discussion of these measures is given in the supplementary readings. In Figure IV-7, internal rates of return are presented for a number of countries based on a compilation prepared by the Higher Education Research Unit of the London School of Economics.

Ideas on Presentation

Rates of return on educational investment were familiar economic measures some time ago. Many educational specialists computed such rate of return estimates. The estimates are essential based on a series of assumptions about earnings in the future by level of schooling, at full employment levels. Data on earnings differences by year of schooling are the starting point for such calculations. If earnings are higher by a thousand with four additional years of school, for example, it assumed that over a life time cycle of earnings, such differences will persist.

The value of the earnings difference can be converted to a present value of "asset" basis. In this second step, the question is essentially being asked how much by way of investment or asset value would

FIGURE IV-7

RATES OF RETURN ON EDUCATION

Private and Social Rates IN PERCENT RETURN

		Social			Private		
Country	*Year*	*Primary*	*Secondary*	*University*	*Primary*	*Secondary*	*University*
Puerto Rico	1960	20.9	23.8	16.0	(1)	24.4	23.0
Mexico	1963	25.0	17.0	23.0	32.0	23.0	29.0
Venezuela	1957	82.0	17.0	23.0	—	29.0	27.0
Colombia	1966	40.0	24.0	8.0	(2)	32.0	15.5
Chile	1959	24.0	16.9	12.2	—	—	—
Brazil	1962	10.7	17.2	14.5	11.3	21.4	38.1
Greece	1964	—	3.0	8.0	—	5.0	14.0
Israel	1958	16.5	6.9	6.6	27.0	6.9	8.0
India	1960	20.2	16.7	12.7	24.7	19.2	14.3
Malaysia	1967	9.3	12.3	10.7	—	—	—
Philippines	1964	8.0	21.0	11.0	8.5	28.0	12.5
S. Korea	1967	12.0	9.0	5.0	—	—	—
Thailand	1970	18.5	11.0	11.0	26.5	13.0	14.0
Nigeria (West)	1966	23.0	12.8	17.0	30.0	14.0	34.0
Ghana	1967	18.0	13.0	16.5	24.5	17.0	37.0
Kenya	1968	21.7	22.9	8.8	32.7	35.2	27.4
Uganda	1966	66.0	28.6	12.0	—	—	—

SOURCE: G. Psacharopoulos, *Returns to Education*, Studies on Education, Elzevier Scientific Publishing Company, London School of Economics, Higher Education Research Unit.

have to be held by the individual in order for him to receive an interest return in the investment or asset equal to the difference in earnings.

Account is taken, of course, of private outlays made when going to school such as tuition and books. And also the value of work that is foregone while attending school is counted as an indirect cost.

Another type of calculation is that of social returns which counts as offsetting costs all the resources spent for schooling, including school expenditures that are financed by taxation and also the labor product that is lost to the economy while persons are going to school.

Rates of return are illustrated in Figure IV-7.

The estimates shown indicate social rates of return were low in several countries for certain types of education (see Greece, Israel, and the Philippines, and in a number of countries the return on university education was less than it was for primary education.

Questions for Discussion

What is the relative share of educational resources spent for those in or from rural areas and from urban areas? Would changes in these relative shares be an appropriate measure of correction of inequality through education? What other measures might be used?

NOTES FOR DISCUSSION LEADER

A series of figures are presented to show inequalities of education measured in several ways. Still other measurements could be shown.

Figure IV-8A shows enrollments percentages by income class. Those in the lowest income bracket have only 15 percent of the children enrolled as contrasted to almost complete enrollment in the upper income class. The 100 percent enrollment rates for the three upper income groups imply, according to Jallade,* that children beyond primary school age in these groups have migrated to cities to get secondary or higher education.

Figure IV-8B shows the distribution of public subsidies for primary and secondary education. In each instance, the public subsidies are shown as a percent of the relative amount of taxes paid by families in each income group. The subsidies for primary schools are largest for the lowest income groups and decrease as income rises. However, for secondary education this is not true. The lowest income groups do not receive subsidies equivalent to their taxes.

Figure IV-8C shows a cumulative distribution of education according to a cumulative distribution of income. The cumulative years of schooling could be displayed in this way as could the cumulative scores on achievement tests by weighting ranked test scores by numbers who were tested. Similarly, other educational outcome differences among income groups could be so displayed.

Inequality could, perhaps, be displayed by inequality in educational outcomes, that is, by the differences in tested basic knowledge, skills and major attitudes.

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* Jallade, Jean-Pierre. *Public Expenditures on Education and Income Distribution in Colombia*. World Bank Staff, Occasional Papers Number 18, 1974, p. 40.

Ideas on Presentation

Formal education is often concentrated in a small percentage of the population in many developing nations with the vast majority having little or no education.

Distributional goals have come to be widely recognized as an important purpose of education. The raising of competence for

work and daily living in the rural areas serves an important development purpose in the demonstration for betterment that it offers. At the same time, the advance in competence that additional resources for education in rural areas means is also a step toward greater equity. In place of the high concentration of resources in urban areas, there is now new emphasis on fairness in resource allocation and on achieving balance in development. This is one measure of inequality.

The key to relating changes in the distribution of income to education in the first instance is to measure the opportunity of acquiring an education by income class of families. The degree to which individuals have the opportunity to enjoy these rewards as related to their family income level measure the changes in income profile that can be expected.

An example of relating the opportunity to participate in the income increasing effects of education by income class is contained in Figure IV-8, and is adapted from a study by Jallade,* showing the enrollment rates by income class of families in rural Colombia. This information, combined with measurements of the income producing effects, will, when measured over time, give a rough measure of income redistribution effects of education.

The second way education can affect income distribution is by changing the income profile as a result of financing education. This involves measuring the proportion of tax monies returned to various income classes as a result of the public subsidization of education. The greater the proportion of tax monies returned in the form of subsidies the better off, in financial terms, is the family. Figure IV-8B shows, for Colombia as a whole, the ratios just described for primary and secondary schools. These results indicate that for the primary level, the poorest families are the prime beneficiaries of the public school system. The poorest 40 percent receive 87 percent of their taxes back in the form of subsidies. These figures are derived from enrollment figures, taxes received, cost subsidization by the state—all by income classes.

The figures for secondary level show the richest 13 percent and poorest 40 percent contributing to the middle 47 percent. In this case, the income changes due to financing education favor the middle classes.

Formal schooling may reinforce income differences rather than

* *Op. cit.*

FIGURE IV-8A

REDISTRIBUTION OF INCOME BY EDUCATION: A MEASURE OF INEQUALITY

(Enrollments by Level of Family Income: Rural Colombia)

Income bracket (Pesos/Year)	*Enrolled in Primary Education (Percent)*
0-6,000	15
6,000-12,000	23
12,000-23,000	33
24,000-60,000	50
60,000-120,000	100[a]
120,000-240,000	100[a]
Over 240,000	100[a]
Total (all children)	23

(a) See text.

SOURCE: Adapted from Jallade, Jean-Pierre. *Public Expenditures on Education and Income Distribution in Colombia.* World Bank Staff, Occasional Papers Number 18, 1974, p. 32.

FIGURE IV-8B

PUBLIC SUBSIDIES FOR TWO LEVELS OF EDUCATION AS A PROPORTION OF TAXES DISTRIBUTED AMONG INCOME GROUPS (%) — COLOMBIA

Income bracket (Pesos/Year)	*Percent households*	*Public subsidies for primary education as proportion of taxes*	*Public subsidies for secondary education as proportion of taxes*
0-6,000	19.0	109	9
6,000-12,000	20.2	77	4
12,000-24,000	24.9	49	18
24,000-60,000	22.9	22	20
60,000-120,000	8.8	4	7
120,000-240,000	3.4	1	3
Over 240,000	0.8	—	1
Total	100.0	16	9

SOURCE: Jean-Pierre Jallade, *Public Expenditures on Education and Income Distribution in Colombia,* World Bank staff, Occasional Papers Number 18, 1974, p. 40.

narrow such differences between persons and regions—urban and rural. Some factors that may contribute to such reinforcement are family living conditions and differential costs of various types and duration of schooling. Thus, families from high income groups have a many faceted impact on the educational achievements of their children: motivation is created for learning; the home is lighted; there is quiet and place for study; encouragement is given for cultural pursuits—for art, theater, travel; there is access to books, to good conversation and to family and family friends with wide range of interests, knowledge, occupational experiences. In contrast, children from poor families do not always receive encouragement for study, work encroaches on their out-of-school hours; there is little place or quiet for study; books or art objects are absent; there is little exposure to persons from professions and little access to ways of understanding the value of education.

These diverse family factors reinforce rather than compensate for existing income differences. School factors tend to work in much the same way. Higher income children are likely to go to better (more expensive) schools with better equipment, facilities and teachers.

These children tend not only to complete primary school but to continue into secondary schooling and later to the university. At each phase, the years of schooling tend to be more than that experienced by low income children and the costs of those years of schooling are higher. For example, the children from higher income families go to universities and to expensive faculties within the university such as medicine.

Income in developing countries is often more widely disparate than it is in the major industrial nations. The actual income distribution in the developing countries often is further from a line of equality shown by the straight line in Figure IV-8C than is the income distribution in a developed nation.

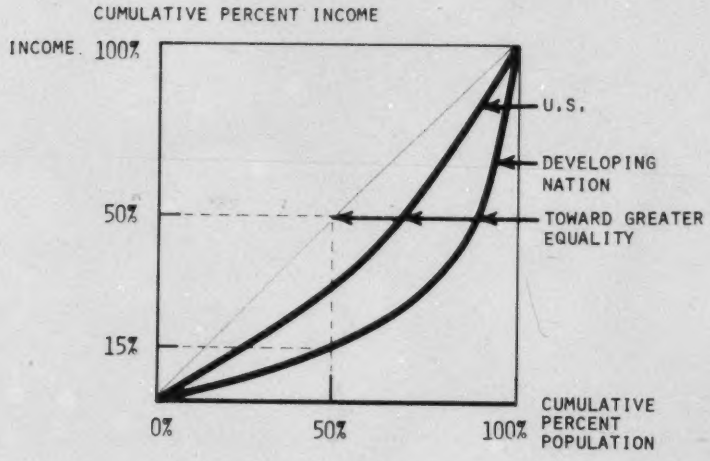
Similar relationships may be observed between income distribution and years of schooling. There is often a wider difference in years of schooling in developing countries than in the developed nations.

Figure IV-8C shows diagramatically the relative inequalities of income in the United States and a developing nation. The developing nation is shown to have less equality in income than the United States. Half of the population have less than 15 percent of the income of the nation. Similarly, educational achievements are often unequally distributed.

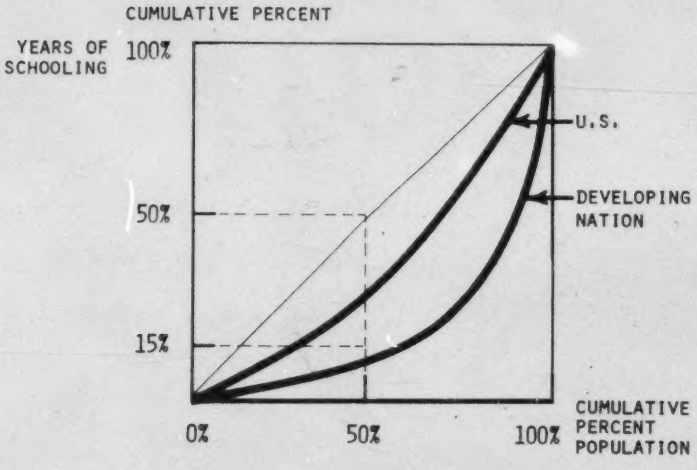
FIGURE IV-8C

INCOME—EDUCATION RELATIONSHIP

Income Distribution



Education Distribution



APPENDIX A

Selected Uses

As indicated in the Preface, some of the materials and "figures" in the six seminars may be particularly useful for the specific groups with whom the discussions are scheduled.

To some extent, selections will be made at the discretion of the discussion leader and may depend in part on the length of time available and on the amount of material included in the seminar.

Brief Comment on Selection from Seminars for Different Groups

Generally, Seminars III and VI, along with introductory material from Seminar I, are the most important for teachers, officials directly concerned with school administration, and teacher training institute instructors.

Seminars II, IV, and VI are most important in providing basic materials for top officials concerned with overall policy planning, middle management officials in Ministries of Education and Finance, and training institute instructors who teach planners and school administrators. Seminar I provides a backdrop discussion of concepts and of the multiplicity of outcome measurements. By and large, Seminar V will help inform top officials in planning and in Ministries of Education and Finance of what they can expect from the analyses.

Selected Uses for Seminar No. IV

Seminar IV should be presented in some detail to those concerned with overall planning and middle management in Ministries of Education and Finance as well as to teachers of planning and school administration. The discussions will introduce the concept of educational productivity and its measurement and show how use of economic and social measures may help top officials determine whether educational goals are being reached.

School administrators and, to a lesser extent, principals could be given a general orientation through discussion of the following topics:

pp. 7-9 Introductory Question
pp. 10-11 Educational outcomes Relating to Societal Objectives
pp. 29-33 Measuring Inequalities of Education.

Teachers may benefit from a brief presentation of the Introductory Question and of the reasons for looking at education as an investment.

FIGURE IV-1

EDUCATIONAL OUTCOMES RELATING TO SOCIETAL OBJECTIVES OF DEVELOPMENT

Motivation to Change

- Initiative
- Creativity
- Leadership
- Risk-taking
- Self-reliance
- Tolerance

Economic Outcomes

- Regional balance and national economic growth
- Skill attainment and productivity increases (investment aspects)

  Direct measures—(actual change in production of goods, e.g., crop increases)

  Indirect measures—(changes in occupational status and earning)

Employment

- Changes in employability
  Access to Advance
- Income distribution consequences

Social Outcomes

- Social Mobility
- Social Integration
- Social Participation
- Health Level Improvement

Political Outcomes

- National Unity
- Democratization

FIGURE IV-2

POSSIBLE APPROACHES TO MEASUREMENT OF SELECTED OUTCOME INDICATORS

	EDUCATIONAL OUTCOME	APPROACHES FOR MEASUREMENT
Motivation to Change	*(1) Initiative*	— observation (structured) — self-report (interview) — employer reports
	42) Leadership	— self-report (questionnaire) — unobtrusive measures (election to office, promotion) — employer reports — non-cognitive tests — observation of community responses
	(3) Risk-taking self-reliance	— self-reports (noncognitive tests, interview, questionnaires) — observation of conduct in community
	(4) Tolerance	— selfreport (noncognitive tests) — observation — reports of associates
	(5) Attitudes on Work	— self report — observation — employer reports
Economic Outcome Indicators	*(1) Regional balance and economic growth*	— urban-rural survey data
	(2) Direct measure of productivity changes	— questionnaire — physical productivity measurement
	(3) Indirect measures of productivity changes	— survey or census; income-education data; cost data
	(4) Unemployment	— urban-rural survey data — observation of male activity
	(5) Income distribution	— census data — survey data observation of differences in property holdings (cattle, house, etc.)
Social Outcome Indicators	*(1) Social participation*	— unobtrusive measures such as (migration to cities; movement among tribes; membership; contributions) — self reports (questionnaire on civil and community participation)
	(2) Health level improvement	— self-report (questionnaire on health practices, attitudes, knowledge) — unobtrusive measures (infant mortality, incidence of cetain diseases) — observation of behavior on health practices
Political Outcome Indicators	*(1) National integration*	— self-reports (questionnaire on attitudes, political participation) — unobtrusive measures (migration, urbanization)
	(2) Democratization	— self-reports (questionnaire on attitudes towards justice, merit and reward, voting practice) — unobtrusive measures (voting pattern)

FIGURE IV-3

MEASURING RESULTS OF EDUCATION FOR MODERNIZATION

Results of n-Ach Training in India:

Percent of Participants who Increased Activity	*Before Course 1962-1964*	*After Course 1964-1966*
Participants in n-Ach training	18%	51%
All controls	22%	25%

Increased achievement motivation showed up in the following economic measures:

Hours worked — at the end of the two-year follow-up twice as many participants reported working longer hours than before the course.

New firms — between 1964 and 1966 almost one trained man in four started a new business (increase from 4 percent to 22 percent); controls remained at about the same level (7 percent to 8 percent).

Capital invested — about ⅓ of all businessmen made specific investments; after training that proportion rose to ¾.

Labor employed — participants employed greater numbers after training than controls.

SOURCE: Adapted from McClelland, David and Winter, David G. *Motivating Economic Achievement*. New York: The Free Press, 1969.

FIGURE IV-4

THE OVERALL ASSESSMENT OF THE USE OF IMPROVED AGRICULTURAL PRACTICES— A SUBJECTIVE ASSESSMENT BY RESPONDENTS

Responder	PI *n* = 72		NPI *n* = 72		PNI *n* = 36		NPNI *n* = 36	
		%		%		%		%
Yield up 75-100%	48	66.67	40	55.56	11	30.55	7	19.44
Yield up 50-75%	13	18.06	12	16.67	13	8.33	2	5.56
Yield up 25-50%	—	—	7	9.72	2	5.56	3	8.33
Less than 25%	—	—	9	12.50	3	8.33	3	8.33
Not increased	3	4.17	—	—	7	19.44	8	22.22
Decreased	4	5.76	2	7.78	1	2.78	4	11.11
Not stated	4	5.76	2	2.78	9	25.00	9	25.00
Total	72	100	72	100	36	100	36	100

PI = participant in literacy program with input (material, reeds, etc.) from CADU (Chillalo Agricultural Development Unit)
NPI = non-participant with input
PNI = participant in literacy program with no input
NPNI = non-participant with no input

FIGURE IV-5

STEPS IN INDIRECTLY MEASURING PRODUCTIVITY THROUGH INCOME

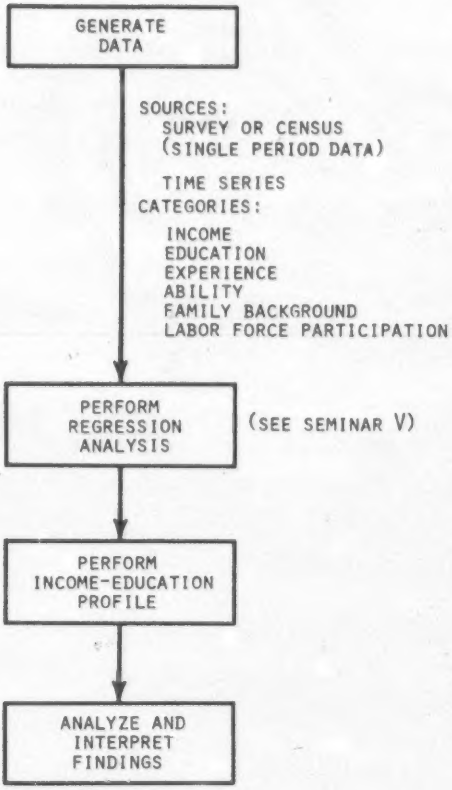
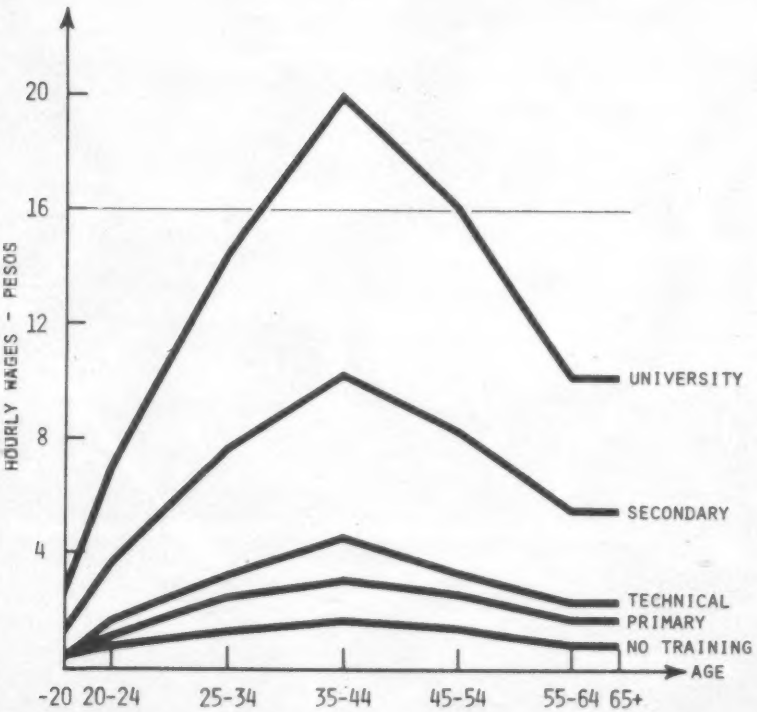


FIGURE IV-6

EARNING AND LEVELS OF SCHOOL COMPLETED: AN EXAMPLE, BOGATA, COLOMBIA, 1965



SOURCE: UNESCO-IIEP, Educational Cost Analysis in Action: Case Studies for Planners II, Paris, 1972.

FIGURE IV-7

RATES OF RETURN ON EDUCATION

Private and Social Rates IN PERCENT RETURN

		Social			Private		
Country	*Year*	*Primary*	*Secondary*	*University*	*Primary*	*Secondary*	*University*
Puerto Rico	1960	20.9	23.8	16.0	(1)	24.4	23.0
Mexico	1963	25.0	17.0	23.0	32.0	23.0	29.0
Venezuela	1957	82.0	17.0	23.0	—	29.0	27.0
Colombia	1966	40.0	24.0	8.0	(2)	32.0	15.5
Chile	1959	24.0	16.9	12.2	—	—	—
Brazil	1962	10.7	17.2	14.5	11.3	21.4	38.1
Greece	1964	—	3.0	8.0	—	5.0	14.0
Israel	1958	16.5	6.9	6.6	27.0	6.9	8.0
India	1960	20.2	16.7	12.7	24.7	19.2	14.3
Malaysia	1967	9.3	12.3	10.7	—	—	—
Philippines	1964	8.0	21.0	11.0	8.5	28.0	12.5
S. Korea	1967	12.0	9.0	5.0	—	—	—
Thailand	1970	18.5	11.0	11.0	26.5	13.0	14.0
Nigeria (West)	1966	23.0	12.8	17.0	30.0	14.0	34.0
Ghana	1967	18.0	13.0	16.5	24.5	17.0	37.0
Kenya	1968	21.7	22.9	8.8	32.7	35.2	27.4
Uganda	1966	66.0	28.6	12.0	—	—	—

SOURCE: G. Psacharopoulos, *Returns to Education*, Studies on Education, Elzevier Scientific Publishing Company, London School of Economics, Higher Education Research Unit.

FIGURE IV-8A

REDISTRIBUTION OF INCOME BY EDUCATION: A MEASURE OF INEQUALITY

(Enrollments by Level of Family Income: Rural Colombia)

Income bracket (Pesos/Year)	*Enrolled in Primary Education (Percent)*
0-6,000	15
6,000-12,000	23
12,000-23,000	33
24,000-60,000	50
60,000-120,000	100[a]
120,000-240,000	100[a]
Over 240,000	100[a]
Total (all children)	23

(a) See text.

SOURCE: Adapted from Jallade, Jean-Pierre, *Public Expenditures on Education and Income Distribution in Colombia*. World Bank Staff, Occasional Papers Number 18, 1974, p. 32.

FIGURE IV-8B

PUBLIC SUBSIDIES FOR TWO LEVELS OF EDUCATION AS A PROPORTION OF TAXES DISTRIBUTED AMONG INCOME GROUPS (%) — COLOMBIA

Income bracket (Pesos/Year)	*Percent households*	*Public subsidies for primary education as proportion of taxes*	*Public subsidies for secondary education as proportion of taxes*
0-6,000	19.0	109	9
6,000-12,000	20.2	77	4
12,000-24,000	24.9	49	18
24,000-60,000	22.9	22	20
60,000-120,000	8.8	4	7
120,000-240,000	3.4	1	3
Over 240,000	0.8	—	1
Total	100.0	16	9

SOURCE: Jean-Pierre Jallade, *Public Expenditures on Education and Income Distribution in Colombia*, World Bank staff, Occasional Papers Number 18, 1974, p. 40.

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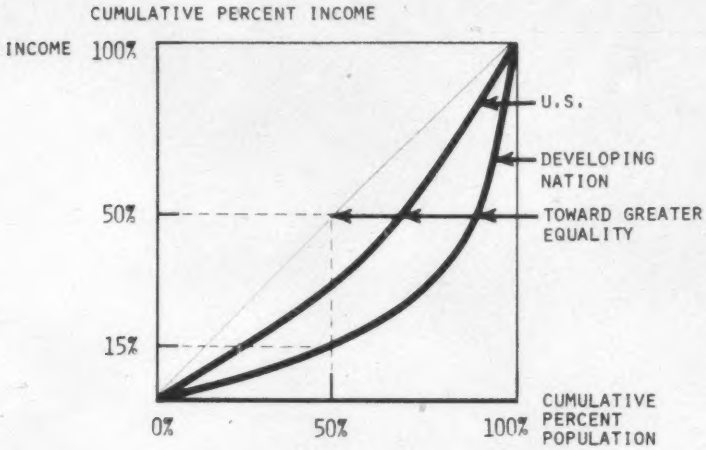
FIGURE IV-8C

INCOME—EDUCATION RELATIONSHIP

Income Distribution



Education Distribution